



US005891021A

United States Patent [19]

Dillon et al.

[11] **Patent Number:** **5,891,021**[45] **Date of Patent:** **Apr. 6, 1999**

[54] **PARTIALLY RIGID-PARTIALLY FLEXIBLE
ELECTRO-OPTICAL SENSOR FOR
FINGERTIP TRANSILLUMINATION**

[75] **Inventors:** Andrew Joseph Dillon, Austin; Jeffrey
Albert Secunda, Dallas; Todd
Johnson, Frisco, all of Tex.

[73] **Assignee:** Perdue Holdings, Inc., Dallas, Tex.

[21] **Appl. No.:** 89,523

[22] **Filed:** Jun. 3, 1998

[51] **Int. Cl.⁶** **A61B 5/00**

[52] **U.S. Cl.** **600/310; 600/344**

[58] **Field of Search** 600/310, 322,
600/323, 340, 344, 473, 476

[56] **References Cited****U.S. PATENT DOCUMENTS**

3,167,658	1/1965	Richter	250/239
3,599,629	8/1971	Gordy	128/2.06
3,602,213	8/1971	Howell et al.	128/2.05
3,769,974	11/1973	Smart et al.	128/2.05
3,807,388	4/1974	Orr et al.	128/205
4,013,067	3/1977	Kresse et al.	128/2.05
4,091,803	5/1978	Pinder	128/2.05
4,305,401	12/1981	Reissmueller et al.	128/690
4,350,165	9/1982	Striese	128/640
4,370,984	2/1983	Cartmell	128/640
4,380,240	4/1983	Jobsis et al.	128/633

4,406,289	9/1983	Wesseling et al.	128/670
4,685,464	8/1987	Goldberger et al.	128/633
4,830,014	5/1989	Goodman et al.	
4,865,038	9/1989	Rich et al.	128/633
5,217,012	6/1993	Young et al.	128/633
5,249,576	10/1993	Goldberger et al.	128/632
5,387,122	2/1995	Goldberger et al.	439/353
5,429,129	7/1995	Lovejoy et al.	128/633
5,676,139	10/1997	Goldberger et al.	128/633

Primary Examiner—Cary E. O'Connor

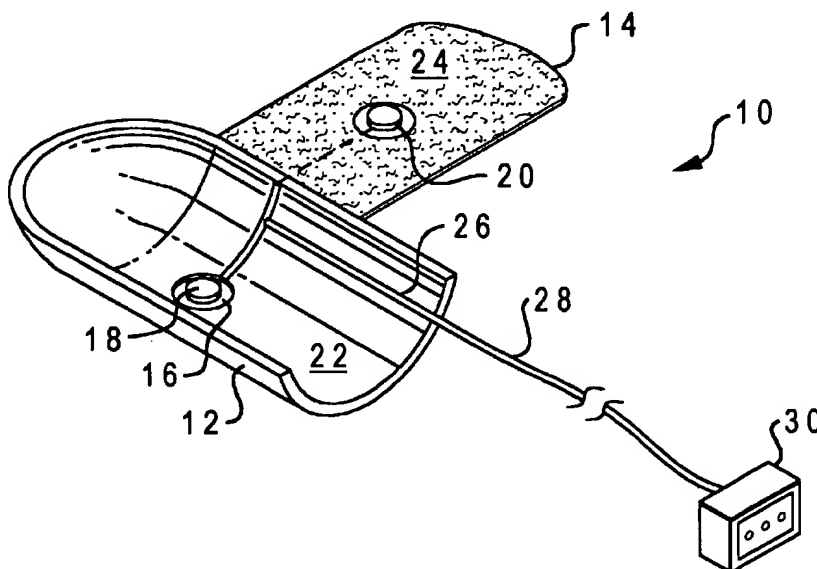
Assistant Examiner—Eric F. Winakur

Attorney, Agent, or Firm—Andrew J. Dillon

[57] **ABSTRACT**

A sensor is provided for transillumination of a blood-profused portion of a human fingertip. The sensor includes an opaque, semi-cylindrical substantially rigid cradle member having a photosensor mounted to a concave surface thereof such that ambient light cannot penetrate the cradle member and induce erroneous readings. A flexible planar web-like support structure is attached at one end thereof to the cradle member and includes a light source mounted within the web thereof. A repositionable adhesive coating on the concave surface of the cradle member holds the fleshy portion of a human fingertip in conformance therewith, and when the flexible planar web-like support structure is wrapped around a fingertip within the cradle member, the light source overlies the photosensor for transillumination of the fingertip.

18 Claims, 2 Drawing Sheets



F09040 "CH E32360